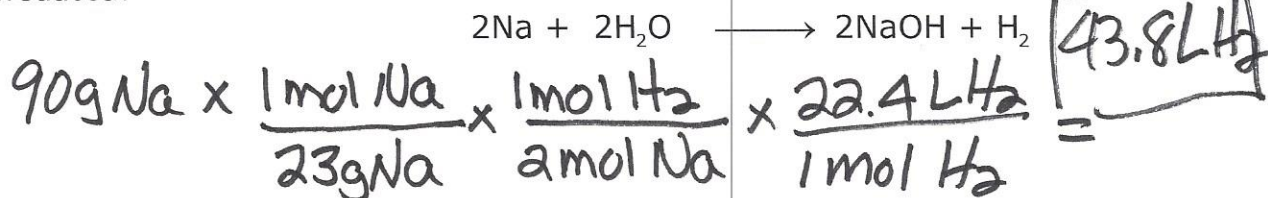
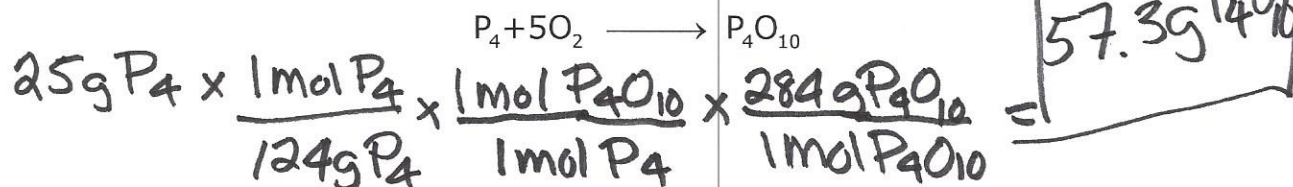


Name KeyChemistry I: Stoichiometry **3**Period \_\_\_\_\_ Date \_\_\_\_\_ **SHOW all work. No work no score!!!!**

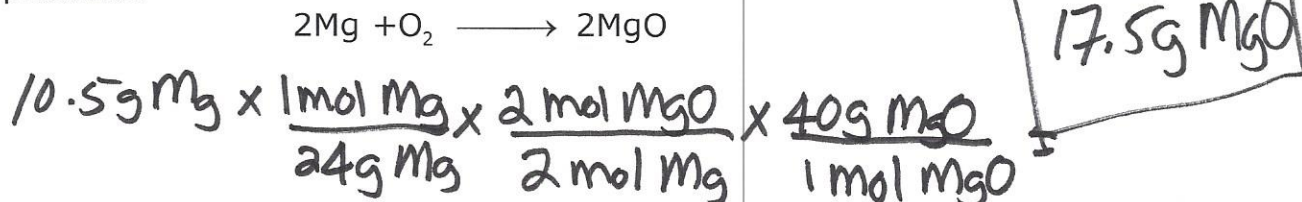
1. Sodium reacts with water to form sodium hydroxide and hydrogen gas. If 90.0 grams of sodium is dropped into water, how many liters of hydrogen at STP would be produced?



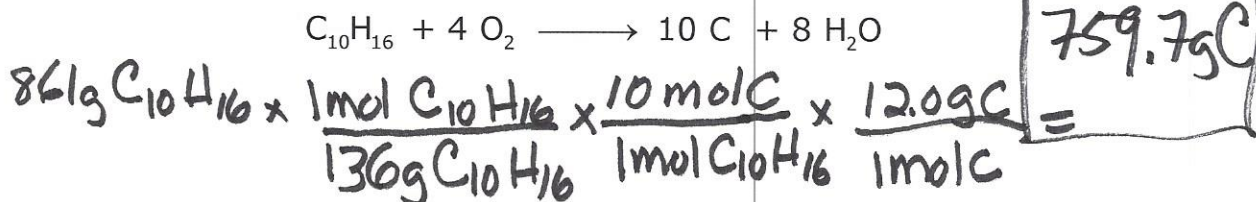
2. The incandescent white of a fireworks display is caused by the reaction of phosphorous with  $\text{O}_2$  to give  $\text{P}_4\text{O}_{10}$ . If 25.0 grams of phosphorus is ignited in a flask containing oxygen at STP, how many grams of  $\text{P}_4\text{O}_{10}$  are formed?



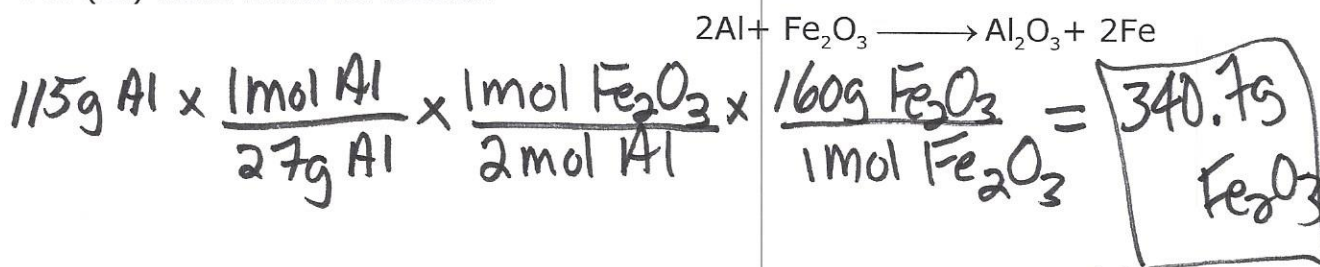
3. Magnesium burns in oxygen to produce magnesium oxide. If 10.5 g of magnesium is ignited in a flask containing oxygen at STP, how many grams of magnesium oxide are produced?



4. Turpentine ( $\text{C}_{10}\text{H}_{16}$ ) burns in air ( $\text{O}_2$ ) to produce carbon (C) and hydrogen hydroxide ( $\text{H}_2\text{O}$ ). How many grams of carbon are produced when 861 g are completely burned?



5. The reaction of powdered aluminum and iron (II) oxide, produces so much heat the iron that forms is molten. Suppose that one batch starts with 115 g Al. How much iron (III) oxide would be needed?



One of the steps in the production of iron utilizes the following chemical reaction:



6. What mass of  $\text{Fe}_2\text{O}_3$  would react with 500.0 liters of CO at STP?

$$500 \text{ L CO} \times \frac{1 \text{ mol CO}}{22.4 \text{ L}} \times \frac{1 \text{ mol Fe}_2\text{O}_3}{3 \text{ mol CO}} \times \frac{160 \text{ g Fe}_2\text{O}_3}{1 \text{ mol Fe}_2\text{O}_3} =$$

$$1190.5 \text{ g Fe}_2\text{O}_3$$

7. What volume of carbon dioxide ( $\text{CO}_2$ ) at STP is produced from 1000 grams of  $\text{Fe}_2\text{O}_3$ ?

$$1000 \text{ g Fe}_2\text{O}_3 \times \frac{1 \text{ mol Fe}_2\text{O}_3}{160 \text{ g Fe}_2\text{O}_3} \times \frac{3 \text{ mol CO}_2}{1 \text{ mol Fe}_2\text{O}_3} \times \frac{22.4 \text{ L CO}_2}{1 \text{ mol CO}_2} =$$

$$420 \text{ L CO}_2$$

8. What mass of iron (Fe) is produced when 3000 mL of  $\text{CO}_2$  is produced at STP?

$$3000 \text{ L CO}_2 \times \frac{1 \text{ mol CO}_2}{22.4 \text{ L CO}_2} \times \frac{2 \text{ mol Fe}}{3 \text{ mol CO}_2} \times \frac{56 \text{ g Fe}}{1 \text{ mol Fe}} =$$

$$5000 \text{ g Fe}$$

9. If 460 g of calcium chloride ( $\text{CaCl}_2$ ) reacts with sodium carbonate; how many grams calcium carbonate will be made?



$$460 \text{ g CaCl}_2 \times \frac{1 \text{ mol CaCl}_2}{111 \text{ g CaCl}_2} \times \frac{1 \text{ mol CaCO}_3}{1 \text{ mol CaCl}_2} \times \frac{100 \text{ g CaCO}_3}{1 \text{ mol CaCO}_3} =$$

$$444.4 \text{ g CaCO}_3$$

10. A 16d common nail weighs 9.25 g and is made of iron. How much rust will be made when this nail is completely rusted away?



$$9.25 \text{ g Fe} \times \frac{1 \text{ mol Fe}}{56 \text{ g Fe}} \times \frac{2 \text{ mol Fe}_2\text{O}_3}{4 \text{ mol Fe}} \times \frac{160 \text{ g Fe}_2\text{O}_3}{1 \text{ mol Fe}_2\text{O}_3} =$$

$$13.2 \text{ g Fe}_2\text{O}_3$$